



1/10/03

AF/2834

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Sidney Bell

Serial No.: 09/748,102

Filed: December 22, 2000

For: ELECTRIC MOTOR HAVING  
ELECTROSTATIC SHIELD  
ARRANGEMENT

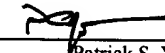
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Group Art Unit: 2834

Examiner: Tamai, K.

Atty. Docket: REEL:0038--1/YOD  
98RE017-A

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08/20/03	
Date	Patrick S. Yoder

**APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 1.191 AND 1.192**

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on May 13, 2003, and received by the Patent Office on May 20, 2003.

1. **REAL PARTY IN INTEREST**

The real party in interest is Reliance Electric Technologies, LLC, the Assignee of the above-referenced application by virtue of the Assignment to Reliance Electric Technologies, LLC, recorded at reel 9215, frame 0808, and dated May 22, 1998.

2. **RELATED APPEALS AND INTERFERENCES**

Appellant is unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal. Reliance Electric Technologies, LLC, the Assignee of the above-referenced application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF CLAIMS**

Claims 1-5, 7-11, and 13-22 are currently pending; claims 6 and 12 were previously canceled without prejudice. Claims 1-5, 7-11, and 13-22 are currently under final rejection and, thus, are the subject of this Appeal.

4. **STATUS OF AMENDMENTS**

All proposed amendments have been entered and considered.

5. **SUMMARY OF THE INVENTION AND OF THE DISCLOSED EMBODIMENTS**

The present invention relates to an improved electrostatic shield arrangement for use in an electromechanical machine, such as an alternating current induction motor. During operation of an electric motor, capacitive coupling may often occur between the stator and rotor. Occasionally, the potential difference developed in this manner may be of sufficient magnitude to break down insulating grease in a bearing assembly supporting a shaft of the motor. In this case, currents may arc or discharge from the bearing balls or rollers to the outer bearing race causing undesirable effects, such as pitting.

To reduce this capacitive coupling between the stator and rotor, an electrostatic shield arrangement provided by the prior art may be advantageously provided. These shields generally comprise an insulative layer disposed between the coil windings and the rotor, and a conductive layer disposed radially inward in respect to the insulative layer. However, it has been found that such prior art electrostatic shields are generally unacceptable unless a top coat of the type recited in the claims is provided due to degradation of, and short circuits caused by, the conductive layer.

In accordance with a described embodiment of the present technique, and referring to Figures 3 and 4 of the present application, an electrostatic shield arrangement is interposed between rotor 40 and the conductive windings of stator 30. The electrostatic shield arrangement provides a conductive path to ground for charge that would otherwise collect on rotor 40. The electrostatic shield arrangement comprises an insulative layer 50 located on the inside surface of

coilheads 36 and 38, as well as along the entire axial extent of each slot 44. A conductive layer 52 is applied to, and radially inward of, insulative layer 50. A nonconductive top coat 54 is advantageously applied over conductive layer 52 to prevent short circuits and to prevent the degradation of conductive layer 52 over time.

6. **ISSUES**

**Issue No. 1:**

Whether claims 1, 2, 7-9, 11, 13, and 14 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 2:**

Whether claims 3-5 and 10 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)(‘353).

**Issue No. 3:**

Whether claim 15 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 4:**

Whether claims 16 and 20 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 5:**

Whether claims 17, 18, and 22 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Cope et al. reference (U.S. Patent No. 4,160,926).

**Issue No. 6:**

Whether claim 19 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference), Andrus (U.S. Patent No. 2,573,126), and Cope et al. (U.S. Patent No. 4,160,926) references.

**Issue No. 7:**

Whether claim 21 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)('353).

7. **GROUPING OF CLAIMS**

The claims may collectively stand or fall for purposes of this Appeal only.

8. **ARGUMENT**

**Issue No. 1:**

As discussed in detail below, the Examiner has improperly rejected claims 1, 2, 7-9, 11, 13, and 14 in view of the cited art. Specifically, in the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 1, 2, 7-9, 11, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references. It is respectfully submitted that the Examiner has misapplied long-standing and binding legal precedents in rejecting the claims under 35 U.S.C. § 103(a). Accordingly, Appellant believes claims 1, 2, 7-9, 11, 13, and 14 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

In rejecting claims 1, 2, 7-9, 11, 13, and 14, the Examiner stated:

Cope teaches every aspect of the invention except the electrostatic shield of resin and conductive paint. Erdman teaches the entire stator length being treated with varnish and then painted with a copper(non-magnetic) paint. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the machine of Cope with a paint applied to the cured resin to construct a Faraday shield, and with the insulative protective top coat of Andrus to keep moisture from the coils and allow the motor to operate in oil or water.

Appellant respectfully traverses this rejection. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

The Examiner has not met his burden in establishing a *prima facie* case of obviousness because the references upon which the Examiner relies fail to disclose each element of independent claims 1 and 9. Furthermore, the Examiner has yet to provide a convincing line of

reasoning as to why one of ordinary skill would make the combination. For these reasons, independent claims 1 and 9 are believed to be patentable over the cited prior art.

**A. The references fail to teach the recited “insulating, protective top coat” as claimed.**

The rejection formulated by the Examiner can only be sustained if the Andrus reference is combinable with the other references and teaches the recited “insulating, protective top coat.” Without this teaching, this element would be entirely absent from the proposed combination.

The Andrus reference is directed to providing “a stator that will operate submerged in water, oil or the like.” Andrus, col. 1, lines 4-6. A further object of the reference is “to provide a stator in which the windings and end coils are effectively sealed from contact with moisture.” Andrus, col. 1, lines 7-9. In order to accomplish these objects, the stator is enclosed within concentric tubes, comprising outer tube 6 and inner tube 8, and the end coils are sealed with molded rubber 12. Andrus, col. 1, lines 13-17; col. 1, line 49 – col. 2, line 26. Inner tube 8 may be comprised of a glass fiber reinforced thermo-setting resin, or a tube of *non-magnetic metal*, which are interchangeable for the purposes of Andrus. Andrus, col. 2, lines 10-14.

Conversely, as stated *supra*, the present application is directed to an improved electrostatic shield arrangement for use in an electromechanical machine. In furtherance of this object, independent claims 1 and 9 of the present application each recite: “an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.” This protective top coat is advantageously applied to the conductive layer to protect this layer from degradation, corrosion, or other pernicious occurrences, and to prevent short circuits that may be caused by the conductive layer. The Examiner contends that inner tube 8 of the Andrus reference reads on this element. Appellant respectfully submits that the Examiner has misconstrued the ordinary meaning of this recitation, particularly in light of the specification of the current application.

In the Final Official Action mailed February 13, 2003, the Examiner responded to Appellant’s arguments on this issue by suggesting that the “only limitations of the protective coat

is [sic] that it is applied over the conductive layer and on an inner surface of the stator.” Paper No. 15, page 6, lines 4-5. However, this view only accounts for the second half of the recitation. Every word in a claim must be considered. Further, a general rule of interpretation is that words in a claim will be given their ordinary and accustomed meaning, unless it appears that the inventor used them differently. *Casler v. United States*, 15 Cl. Ct. 717, 9 U.S.P.Q.2d 1753 (1988). In regard to the present claims, Appellant submits that Andrus does not teach that inner tube 8 is an “insulating, protective top coat” as recited in the instant claims and used in the specification.

1. *Andrus does not teach that tube 8 is or should be a “top coat applied over [a] conductive layer.”*

The word “coat” is defined as “a layer of material covering something else; a coating: *a second coat of paint*.” The American Heritage Dictionary of the English Language (4<sup>th</sup> ed. 2000). A “top coat” is, therefore, a top layer of material covering a surface. In the present application, layers are being applied radially inward from the stator. Protective top coat 54 is a “top coat” because it is applied on top of the previous layers and has no layer subsequently applied to it; it is the outermost layer in relation to the substrate formed of the stator, the insulative layer, and the conductive layer. As pointed out in an earlier Response, in the preferred embodiment of the Andrus reference, the inner tube 8 is bonded to a molded rubber piece 12 and the outer tube 6 by cement 13. Andrus, col. 2, lines 21-26; *see also* Figure 1. As such, the inner tube 8 is not *applied* to the stator, but merely abuts against it and *is not a top coat* as recited in the instant claims. The mere fact that tube 8 is adjacent to the interior of the stator assembly 1 is not sufficient support to contend that the tube 8 discloses the “top coat” as recited in claims 1 and 9.

In the Final Official Action mailed February 13, 2003, the Examiner responded to this argument by pointing out that, in an alternative embodiment, the inner tube 8 may be bonded to the stator laminations 2 by means of a layer of cement 13. Paper No. 15, page 6, lines 8-11; *see* Andrus, Figure 7; col. 3, lines 40-45. In this scenario, the inner tube 8 is on top but it is not applied to the laminations. Instead it is the cement 13 that is coating the laminations. The inner

tube 8 is disposed over this interceding layer of cement 13. Therefore, it would be cement 13 applied to any conductive layer disposed in the stator, not inner tube 8. Consequently, even in regard to the non-preferred embodiment, it would be inappropriate to equate inner tube 8 with “an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.”

2. Andrus provides no basis for choosing an “insulative” tube over a conductive tube.

For the purposes of Andrus and for the very basis for the combination relied upon by the Examiner, inner tube 8 of Andrus may be conductive or nonconductive. That is, the tube may be made of a plastic or a metal. There is no basis whatsoever for selecting the plastic tube over the metal tube, except hindsight gained from the claims under appeal. The reference provides none. One skilled in the art, given the teachings of Andrus, would be *equally likely* to select the metal tube for the purpose of enabling a motor to operate submerged in oil or water.

It is axiomatic that prior art references must be considered in their entirety. The Federal Circuit emphasized this point in the case of *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, where it was held that:

It is impermissible within the framework of 35 U.S.C. §103 to pick and choose from any one reference *only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests* to one skilled in the art.

*Id.*, 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986) (emphasis added).

In the present context, Andrus, for the purpose of enabling a motor to be submerged, fairly suggests the use of *either* a plastic inner tube or a metallic one. The metallic tube would, however, be entirely unacceptable for the purpose of covering the shield of the claims under appeal. That very fact serves to demonstrate that the reference could not be relied upon by one skilled in the art of shielded motor designs, absent hindsight.



**B. The references fail to provide a suggestion or motivation for the proposed combination.**

Assuming, *arguendo*, the Examiner were able to find references that disclose each and every element of the instant claims, the Examiner must still provide a convincing line of reasoning as to why one of ordinary skill would make the combination. Appellant respectfully asserts the Examiner has failed to do so as yet.

The Andrus reference teaches a specific solution to a specific problem. The Examiner has repeatedly argued it would have been obvious to a person of ordinary skill in the art at the time of the invention to construct a motor with a Faraday shield, and with the insulative protective top coat of Andrus “to keep moisture from the coils and allow the motor to operate in oil or water.” Paper 15, page 2, lines 12-15. While Appellant readily concedes that the purpose of Andrus is to enable a motor to be submersible, and that the enclosure formed by outer tube 6, inner tube 8, and molding rubber 12, are intended to facilitate this purpose; Appellant vigorously traverses the Examiner’s argument attributing this same purpose to the present application.

This problem is *not* relevant to the arrangement recited in the claims under appeal. As discussed above, the present application is directed to reducing the capacitive coupling between the stator and rotor by employing an improved electrostatic shield arrangement. The protective top coat recited in the claims is a part of this arrangement, and serves to reduce degradation of the conductive layer of the electrostatic shield and prevent short circuits attributable to this conductive layer. This protective top coat *is not* incorporated in the present technique to provide submergibility and protect the coils from moisture. Additionally, the “insulative layer of resin material” and “insulative layer having a conformal structure characteristic of a resin” of independent claims 1 and 9 respectively, already provide for protection of the coils and, theoretically at least, operability in oil or water, if that functionality were even relevant to the claimed invention. Because the insulative layer would theoretically provide these benefits independent of the protective top coat, it would be completely redundant, to say the least, to provide an additional protective top coat. Consequently, there would be no motivation for

combining the inner tube of Andrus with the other references in the manner suggested by the Examiner if one skilled in the art were concerned about submerging the motor.

Furthermore, the references *fail to even recognize the problem* solved by the present technique and are therefore not properly combinable. Patentability is gauged not only by the extent or simplicity of physical changes, but also by the perception of the necessity or desirability of making such changes to produce a new result. When viewed after disclosure, the changes may seem simple and such as should have been obvious to those in the field. However, this does not negative invention or patentability. The conception of a new and useful improvement must be considered along with the actual means of achieving it in determining the presence or absence of invention. In the present case, the use of an electrostatic shield or conductive paint layer and an insulative top coat represent an entirely new combination motivated by an entirely different conception from that of Andrus or the other cited references.

The discovery of a problem calling for an improvement is often a very essential element in an invention correcting such a problem. Although the physical means of accomplishing the Appellant's improvement and its new and useful results are simple, the conception of so improving on the prior art devices would not be obvious to those skilled in the art. *See In re Bisley*, 197 F.2d 355, 94 U.S.P.Q. 80, 86, 87 (C.C.P.A. 1952). When a person, having the references before him and not being cognizant of an applicant's disclosure, would not be informed that a problem solved by the applicant's claimed invention ever existed, such references (which never recognized the problem) *could not have suggested* its solution. As in the case of *In re Shaffer*, in the present case, the references were thus improperly combined since there is no suggestion in any of them that they can be combined to produce the result obtained by the claimed invention. *See In re Shaffer*, 229 F.2d 476, 108 U.S.P.Q. 326, 329 (C.C.P.A. 1956).

Again, the present technique recognizes and addresses a problem with electrostatic shields of the type disclosed by the Erdman references (IEEE Conference and '353). Specifically, the electrostatic shield arrangement of Erdman is generally unacceptable due to degradation of, and short circuits caused by, the conductive layer. The present application solves

this problem by advantageously applying “an insulating, protective top coat” over the conductive layer. The Cope et al., Erdman et al. (IEEE Conference), and Andrus references presently cited by the Examiner fail to recognize this problem solved by the current technique. Similar to the situation in *Shaffer*, the combination of these references is improper because there is no suggestion in any of the references that they can be combined *to solve the only relevant problem*, that is, to prevent short circuits caused by an electrostatic shield arrangement.

In summary, a prima facie case of obviousness has not been established with respect to independent claims 1 and 9. The cited references fail to disclose each element of claims 1 and 9. The Examiner has failed to provide a convincing line of reasoning as to why one of ordinary skill would combine these references. Still further, the references are not properly combinable because they fail to recognize the problem solved by the claimed invention.

Based on the foregoing, Appellant respectfully submits that independent claims 1 and 9 are patentable over the references taken alone or in combination. Moreover, dependent claims 2, 7, 8, 11, 13, and 14 are also believed patentable for their dependencies upon allowable base claims 1 and 9, as well as for the additional features they recite. Reconsideration and a favorable review by the Board are respectfully requested.

**Issue No. 2:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 3-5 and 10 under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)('353). However, claims 3-5 and 10 depend from independent claims 1 and 9 respectively. Consequently, dependent claims 3-5 and 10 are believed patentable not only for their dependencies upon allowable base claims 1 and 9, but also by virtue of the additional features they recite. Accordingly, Appellant believes that claims 3-5 and 10 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 3:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 15 under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references. However, claim 15 depends from independent claim 9. Consequently, dependent claim 15 is believed patentable not only for its dependency upon allowable base claim 9, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 15 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 4:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 16 and 20 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references. It is respectfully submitted that the Examiner has misapplied long-standing and binding legal precedents in rejecting the claims under 35 U.S.C. § 103(a). Accordingly, Appellant believes claims 16 and 20 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

In rejecting claims 16 and 20, the Examiner stated:

Erdman teaches a motor with a stator and rotor. The stator core and windings are covered with a varnish and then and [sic] covered with a paint (inherently bonded to the stator). Erdman does not teach the conductive paint covered with an insulative layer. Andrus teaches the stator covered with an insulative layer 8 (plastic) to seal the stator against moisture and allow the motor to operate in oil or water. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the motor of Erdman with an inner insulative layer, as in Andrus to seal the stator against moisture and allow the motor to operate in oil or water.

Independent claim 16 recites an “insulative layer disposed over said electrostatic shield between said conductive windings of said stator and said rotor.” This insulative layer of claim 16 is similar to, and serves the same purpose as, the “insulating, protective top coat” of

independent claims 1 and 9. Appellant respectfully submits that independent claim 16 is patentable over the references taken alone or in combination, for at least the same reasons provided above with respect to independent claims 1 and 9. Moreover, dependent claim 20 is also believed patentable for its dependency upon allowable independent claim 16 as well as by virtue of the additional features they recite. Reconsideration and a favorable review by the Board are respectfully requested.

**Issue No. 5:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 17, 18, and 22 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Cope et al. reference (U.S. Patent No. 4,160,926). However, claims 17, 18, and 22 depend from independent claim 16. Consequently, dependent claims 17, 18, and 22 are believed patentable not only for their dependencies upon allowable base claims 16, but also by virtue of the additional features they recite. Accordingly, Appellant believes that claims 17, 18, and 22 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 6:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 19 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference), Andrus (U.S. Patent No. 2,573,126), and Cope et al. (U.S. Patent No. 4,160,926) references. However, claim 19 depends from independent claim 16. Consequently, dependent claim 19 is believed patentable not only for its dependency upon allowable base claim 16, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 19 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 7:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 21 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)(‘353). However, claim 21 depends from independent claim 16. Consequently, dependent claim 21 is believed patentable not only for its dependency upon allowable base claim 16, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 21 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**CONCLUSION**

The Commissioner is authorized to charge the requisite fee of \$320.00, and any additional fees which may be required, to Account No. 01-0857, Order No. 98RE017-A/YOD (REEL:0038--1). A duplicate copy of this sheet is enclosed.

**General Authorization for Extensions of Time**

In accordance with 37 C.F.R. § 1.136, Appellant hereby provides a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Appellant authorizes the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 01-0857, Order No. 98RE017-A/YOD (REEL:0038--1).

Respectfully submitted,

Date: 8/20/2003

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9. **APPENDIX OF CLAIMS ON APPEAL**

1. An electromechanical machine comprising:

a fixed stator having conductive windings located in a plurality of parallel, axially-extending winding slots defined about an inner surface of a magnetically permeable core, said stator further comprising first and second coilheads located at opposite axial ends of said magnetically permeable core;

each of said winding slots including an insulative top liner located radially inward of said conductive windings located therein;

a movable rotor located radially inward of said stator;

an electrostatic shield arrangement being formed by an insulative layer of resin material covered by a conductive layer located radially inward thereof;

said insulative layer and said conductive layer being conformally applied to said stator so as to be located in said winding slots radially inward of said respective top liner and an inside surface of said first and second coilheads to interpose said conductive windings and said rotor; and

an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.

2. An electromechanical machine as set forth in claim 1, wherein said conductive layer of said shield arrangement comprises a nonmagnetic conductive material located radially inward of said insulative layer.

3. An electromechanical machine as set forth in claim 2, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

4. An electromechanical machine as set forth in claim 3, wherein said conductive layer of said shield arrangement comprises a metallic paint applied to a surface of said insulative layer.



5. An electromechanical machine as set forth in claim 4, wherein said metallic paint comprises a copper paint.

7. An electromechanical machine as set forth in claim 1, wherein said insulative layer of said shield arrangement comprises a glass-filled thermoset resin applied to said conductive windings to a predetermined thickness.

8. An electromechanical machine as set forth in claim 7, wherein said thermoset resin substantially entirely impregnates said conductive windings of said stator.

9. An electromechanical machine comprising:  
a fixed stator having conductive windings located in a plurality of parallel, axially extending winding slots defined in a magnetically permeable core;  
a movable rotor operative to have a magnetic flux induced therein by excitation of said conductive windings of said stator;  
an insulative layer having a conformal structure characteristic of a resin that had been applied to said stator in an uncured state after said conductive windings were placed in said winding slots and subsequently cured to yield a predetermined layer thickness between said conductive windings and said rotor; and  
a conductive layer of metallic paint bonded to said insulative layer and thereby separated from said conductive windings, said insulative layer and said conductive layer thereby forming an electrostatic shield arrangement interposing said conductive windings and said rotor; and  
an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.

10. An electromechanical machine as set forth in claim 9, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

11. An electromechanical machine as set forth in claim 9, wherein said metallic paint comprises a copper paint.

13. An electromechanical machine as set forth in claim 9, wherein said cured resin substantially entirely impregnates said conductive windings of said stator.

14. An electromechanical machine as set forth in claim 9, wherein said cured resin is a glass- filled thermoset resin.

15. An electromechanical machine as set forth in claim 14, wherein said predetermined thickness of said insulative layer is at least approximately 0.012 inches.

16. An electromechanical machine comprising:  
a stator having conductive windings located in a plurality of parallel, axially extending winding slots defined in a magnetically permeable core;  
a rotor disposed axially within said stator;  
an electrostatic shield comprising a conductive layer disposed on an inner surface of said stator at least opposite said rotor and electrically insulated from said conductive windings of the stator; and  
an insulative layer disposed over said electrostatic shield between said conductive windings of said stator and said rotor.

17. An electromechanical machine as set forth in claim 16, further comprising an insulative layer having a conformal structure characteristic of a resin that had been applied to said stator in an uncured state after said conductive windings were placed in said winding slots and subsequently cured to yield a predetermined layer thickness between said conductive windings and said rotor.

18. An electromechanical machine as set forth in claim 17, wherein said cured resin is a glass-filled thermoset resin.

19. An electromechanical machine as set forth in claim 17, wherein said predetermined thickness of said insulative layer is at least approximately 0.012 inches.

20. An electromechanical machine as set forth in claim 16, wherein said conductive layer comprises a conductive paint bonded to said stator.

21. An electromechanical machine as set forth in claim 16, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

22. An electromechanical machine as set forth in claim 16, wherein said cured resin substantially entirely impregnates said conductive windings of said stator.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Sidney Bell

Serial No.: 09/748,102

Filed: December 22, 2000

For: ELECTRIC MOTOR HAVING  
ELECTROSTATIC SHIELD  
ARRANGEMENT


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Group Art Unit: 2834

Examiner: Tamai, K.

Atty. Docket: REEL:0038--1/YOD  
98RE017-A

**MAIL STOP Appeal Brief-Patents**  
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CERTIFICATE OF MAILING 37 C.F.R. 1.8	
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08/20/03	
Date	Patrick S. Yoder

**APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 1.191 AND 1.192**

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on May 13, 2003, and received by the Patent Office on May 20, 2003.

1. **REAL PARTY IN INTEREST**

The real party in interest is Reliance Electric Technologies, LLC, the Assignee of the above-referenced application by virtue of the Assignment to Reliance Electric Technologies, LLC, recorded at reel 9215, frame 0808, and dated May 22, 1998.

2. **RELATED APPEALS AND INTERFERENCES**

Appellant is unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellant's legal representative in this Appeal. Reliance Electric Technologies, LLC, the Assignee of the above-referenced application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF CLAIMS**

Claims 1-5, 7-11, and 13-22 are currently pending; claims 6 and 12 were previously canceled without prejudice. Claims 1-5, 7-11, and 13-22 are currently under final rejection and, thus, are the subject of this Appeal.

4. **STATUS OF AMENDMENTS**

All proposed amendments have been entered and considered.

5. **SUMMARY OF THE INVENTION AND OF THE DISCLOSED EMBODIMENTS**

The present invention relates to an improved electrostatic shield arrangement for use in an electromechanical machine, such as an alternating current induction motor. During operation of an electric motor, capacitive coupling may often occur between the stator and rotor. Occasionally, the potential difference developed in this manner may be of sufficient magnitude to break down insulating grease in a bearing assembly supporting a shaft of the motor. In this case, currents may arc or discharge from the bearing balls or rollers to the outer bearing race causing undesirable effects, such as pitting.

To reduce this capacitive coupling between the stator and rotor, an electrostatic shield arrangement provided by the prior art may be advantageously provided. These shields generally comprise an insulative layer disposed between the coil windings and the rotor, and a conductive layer disposed radially inward in respect to the insulative layer. However, it has been found that such prior art electrostatic shields are generally unacceptable unless a top coat of the type recited in the claims is provided due to degradation of, and short circuits caused by, the conductive layer.

In accordance with a described embodiment of the present technique, and referring to Figures 3 and 4 of the present application, an electrostatic shield arrangement is interposed between rotor 40 and the conductive windings of stator 30. The electrostatic shield arrangement provides a conductive path to ground for charge that would otherwise collect on rotor 40. The electrostatic shield arrangement comprises an insulative layer 50 located on the inside surface of

coilheads 36 and 38, as well as along the entire axial extent of each slot 44. A conductive layer 52 is applied to, and radially inward of, insulative layer 50. A nonconductive top coat 54 is advantageously applied over conductive layer 52 to prevent short circuits and to prevent the degradation of conductive layer 52 over time.

6. **ISSUES**

**Issue No. 1:**

Whether claims 1, 2, 7-9, 11, 13, and 14 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 2:**

Whether claims 3-5 and 10 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)('353).

**Issue No. 3:**

Whether claim 15 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 4:**

Whether claims 16 and 20 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references.

**Issue No. 5:**

Whether claims 17, 18, and 22 are unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Cope et al. reference (U.S. Patent No. 4,160,926).

**Issue No. 6:**

Whether claim 19 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference), Andrus (U.S. Patent No. 2,573,126), and Cope et al. (U.S. Patent No. 4,160,926) references.

**Issue No. 7:**

Whether claim 21 is unpatentable under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)(‘353).

7. **GROUPING OF CLAIMS**

The claims may collectively stand or fall for purposes of this Appeal only.

8. **ARGUMENT**

**Issue No. 1:**

As discussed in detail below, the Examiner has improperly rejected claims 1, 2, 7-9, 11, 13, and 14 in view of the cited art. Specifically, in the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 1, 2, 7-9, 11, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references. It is respectfully submitted that the Examiner has misapplied long-standing and binding legal precedents in rejecting the claims under 35 U.S.C. § 103(a). Accordingly, Appellant believes claims 1, 2, 7-9, 11, 13, and 14 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

In rejecting claims 1, 2, 7-9, 11, 13, and 14, the Examiner stated:

Cope teaches every aspect of the invention except the electrostatic shield of resin and conductive paint. Erdman teaches the entire stator length being treated with varnish and then painted with a copper(non-magnetic) paint. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the machine of Cope with a paint applied to the cured resin to construct a Faraday shield, and with the insulative protective top coat of Andrus to keep moisture from the coils and allow the motor to operate in oil or water.

Appellant respectfully traverses this rejection. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

The Examiner has not met his burden in establishing a *prima facie* case of obviousness because the references upon which the Examiner relies fail to disclose each element of independent claims 1 and 9. Furthermore, the Examiner has yet to provide a convincing line of



reasoning as to why one of ordinary skill would make the combination. For these reasons, independent claims 1 and 9 are believed to be patentable over the cited prior art.

**A. The references fail to *teach* the recited “insulating, protective top coat” as claimed.**

The rejection formulated by the Examiner can only be sustained if the Andrus reference is combinable with the other references and teaches the recited “insulating, protective top coat.” Without this teaching, this element would be entirely absent from the proposed combination.

The Andrus reference is directed to providing “a stator that will operate submerged in water, oil or the like.” Andrus, col. 1, lines 4-6. A further object of the reference is “to provide a stator in which the windings and end coils are effectively sealed from contact with moisture.” Andrus, col. 1, lines 7-9. In order to accomplish these objects, the stator is enclosed within concentric tubes, comprising outer tube 6 and inner tube 8, and the end coils are sealed with molded rubber 12. Andrus, col. 1, lines 13-17; col. 1, line 49 – col. 2, line 26. Inner tube 8 may be comprised of a glass fiber reinforced thermo-setting resin, or a tube of *non-magnetic metal*, which are interchangeable for the purposes of Andrus. Andrus, col. 2, lines 10-14.

Conversely, as stated *supra*, the present application is directed to an improved electrostatic shield arrangement for use in an electromechanical machine. In furtherance of this object, independent claims 1 and 9 of the present application each recite: “an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.” This protective top coat is advantageously applied to the conductive layer to protect this layer from degradation, corrosion, or other pernicious occurrences, and to prevent short circuits that may be caused by the conductive layer. The Examiner contends that inner tube 8 of the Andrus reference reads on this element. Appellant respectfully submits that the Examiner has misconstrued the ordinary meaning of this recitation, particularly in light of the specification of the current application.

In the Final Official Action mailed February 13, 2003, the Examiner responded to Appellant’s arguments on this issue by suggesting that the “only limitations of the protective coat

is [sic] that it is applied over the conductive layer and on an inner surface of the stator.” Paper No. 15, page 6, lines 4-5. However, this view only accounts for the second half of the recitation. Every word in a claim must be considered. Further, a general rule of interpretation is that words in a claim will be given their ordinary and accustomed meaning, unless it appears that the inventor used them differently. *Casler v. United States*, 15 Cl. Ct. 717, 9 U.S.P.Q.2d 1753 (1988). In regard to the present claims, Appellant submits that Andrus does not teach that inner tube 8 is an “insulating, protective top coat” as recited in the instant claims and used in the specification.

1. Andrus does not teach that tube 8 is or should be a “top coat applied over [a] conductive layer.”

The word “coat” is defined as “a layer of material covering something else; a coating; a second coat of paint.” The American Heritage Dictionary of the English Language (4<sup>th</sup> ed. 2000). A “top coat” is, therefore, a top layer of material covering a surface. In the present application, layers are being applied radially inward from the stator. Protective top coat 54 is a “top coat” because it is applied on top of the previous layers and has no layer subsequently applied to it; it is the outermost layer in relation to the substrate formed of the stator, the insulative layer, and the conductive layer. As pointed out in an earlier Response, in the preferred embodiment of the Andrus reference, the inner tube 8 is bonded to a molded rubber piece 12 and the outer tube 6 by cement 13. Andrus, col. 2, lines 21-26; *see also* Figure 1. As such, the inner tube 8 is not *applied* to the stator, but merely abuts against it and *is not a top coat* as recited in the instant claims. The mere fact that tube 8 is adjacent to the interior of the stator assembly 1 is not sufficient support to contend that the tube 8 discloses the “top coat” as recited in claims 1 and 9.

In the Final Official Action mailed February 13, 2003, the Examiner responded to this argument by pointing out that, in an alternative embodiment, the inner tube 8 may be bonded to the stator laminations 2 by means of a layer of cement 13. Paper No. 15, page 6, lines 8-11; *see* Andrus, Figure 7; col. 3, lines 40-45. In this scenario, the inner tube 8 is on top but it is not applied to the laminations. Instead it is the cement 13 that is coating the laminations. The inner

tube 8 is disposed over this interceding layer of cement 13. Therefore, it would be cement 13 applied to any conductive layer disposed in the stator, not inner tube 8. Consequently, even in regard to the non-preferred embodiment, it would be inappropriate to equate inner tube 8 with “an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.”

2. Andrus provides no basis for choosing an “insulative” tube over a conductive tube.

For the purposes of Andrus and for the very basis for the combination relied upon by the Examiner, inner tube 8 of Andrus may be conductive or nonconductive. That is, the tube may be made of a plastic or a metal. There is no basis whatsoever for selecting the plastic tube over the metal tube, except hindsight gained from the claims under appeal. The reference provides none. One skilled in the art, given the teachings of Andrus, would be *equally likely* to select the metal tube for the purpose of enabling a motor to operate submerged in oil or water.

It is axiomatic that prior art references must be considered in their entirety. The Federal Circuit emphasized this point in the case of *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, where it was held that:

It is impermissible within the framework of 35 U.S.C. §103 to pick and choose from any one reference *only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests* to one skilled in the art.

*Id.*, 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986) (emphasis added).

In the present context, Andrus, for the purpose of enabling a motor to be submerged, fairly suggests the use of *either* a plastic inner tube or a metallic one. The metallic tube would, however, be entirely unacceptable for the purpose of covering the shield of the claims under appeal. That very fact serves to demonstrate that the reference could not be relied upon by one skilled in the art of shielded motor designs, absent hindsight.

**B. The references fail to provide a suggestion or motivation for the proposed combination.**

Assuming, *arguendo*, the Examiner were able to find references that disclose each and every element of the instant claims, the Examiner must still provide a convincing line of reasoning as to why one of ordinary skill would make the combination. Appellant respectfully asserts the Examiner has failed to do so as yet.

The Andrus reference teaches a specific solution to a specific problem. The Examiner has repeatedly argued it would have been obvious to a person of ordinary skill in the art at the time of the invention to construct a motor with a Faraday shield, and with the insulative protective top coat of Andrus “to keep moisture from the coils and allow the motor to operate in oil or water.” Paper 15, page 2, lines 12-15. While Appellant readily concedes that the purpose of Andrus is to enable a motor to be submersible, and that the enclosure formed by outer tube 6, inner tube 8, and molding rubber 12, are intended to facilitate this purpose; Appellant vigorously traverses the Examiner’s argument attributing this same purpose to the present application.

This problem is *not* relevant to the arrangement recited in the claims under appeal. As discussed above, the present application is directed to reducing the capacitive coupling between the stator and rotor by employing an improved electrostatic shield arrangement. The protective top coat recited in the claims is a part of this arrangement, and serves to reduce degradation of the conductive layer of the electrostatic shield and prevent short circuits attributable to this conductive layer. This protective top coat *is not* incorporated in the present technique to provide submergibility and protect the coils from moisture. Additionally, the “insulative layer of resin material” and “insulative layer having a conformal structure characteristic of a resin” of independent claims 1 and 9 respectively, already provide for protection of the coils and, theoretically at least, operability in oil or water, if that functionality were even relevant to the claimed invention. Because the insulative layer would theoretically provide these benefits independent of the protective top coat, it would be completely redundant, to say the least, to provide an additional protective top coat. Consequently, there would be no motivation for

combining the inner tube of Andrus with the other references in the manner suggested by the Examiner if one skilled in the art were concerned about submerging the motor.

Furthermore, the references *fail to even recognize the problem* solved by the present technique and are therefore not properly combinable. Patentability is gauged not only by the extent or simplicity of physical changes, but also by the perception of the necessity or desirability of making such changes to produce a new result. When viewed after disclosure, the changes may seem simple and such as should have been obvious to those in the field. However, this does not negative invention or patentability. The conception of a new and useful improvement must be considered along with the actual means of achieving it in determining the presence or absence of invention. In the present case, the use of an electrostatic shield or conductive paint layer and an insulative top coat represent an entirely new combination motivated by an entirely different conception from that of Andrus or the other cited references.

The discovery of a problem calling for an improvement is often a very essential element in an invention correcting such a problem. Although the physical means of accomplishing the Appellant's improvement and its new and useful results are simple, the conception of so improving on the prior art devices would not be obvious to those skilled in the art. *See In re Bisley*, 197 F.2d 355, 94 U.S.P.Q. 80, 86, 87 (C.C.P.A. 1952). When a person, having the references before him and not being cognizant of an applicant's disclosure, would not be informed that a problem solved by the applicant's claimed invention ever existed, such references (which never recognized the problem) *could not have suggested* its solution. As in the case of *In re Shaffer*, in the present case, the references were thus improperly combined since there is no suggestion in any of them that they can be combined to produce the result obtained by the claimed invention. *See In re Shaffer*, 229 F.2d 476, 108 U.S.P.Q. 326, 329 (C.C.P.A. 1956).

Again, the present technique recognizes and addresses a problem with electrostatic shields of the type disclosed by the Erdman references (IEEE Conference and '353). Specifically, the electrostatic shield arrangement of Erdman is generally unacceptable due to degradation of, and short circuits caused by, the conductive layer. The present application solves

this problem by advantageously applying “an insulating, protective top coat” over the conductive layer. The Cope et al., Erdman et al. (IEEE Conference), and Andrus references presently cited by the Examiner fail to recognize this problem solved by the current technique. Similar to the situation in *Shaffer*, the combination of these references is improper because there is no suggestion in any of the references that they can be combined *to solve the only relevant problem*, that is, to prevent short circuits caused by an electrostatic shield arrangement.

In summary, a prima facie case of obviousness has not been established with respect to independent claims 1 and 9. The cited references fail to disclose each element of claims 1 and 9. The Examiner has failed to provide a convincing line of reasoning as to why one of ordinary skill would combine these references. Still further, the references are not properly combinable because they fail to recognize the problem solved by the claimed invention.

Based on the foregoing, Appellant respectfully submits that independent claims 1 and 9 are patentable over the references taken alone or in combination. Moreover, dependent claims 2, 7, 8, 11, 13, and 14 are also believed patentable for their dependencies upon allowable base claims 1 and 9, as well as for the additional features they recite. Reconsideration and a favorable review by the Board are respectfully requested.

**Issue No. 2:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 3-5 and 10 under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353) (‘353). However, claims 3-5 and 10 depend from independent claims 1 and 9 respectively. Consequently, dependent claims 3-5 and 10 are believed patentable not only for their dependencies upon allowable base claims 1 and 9, but also by virtue of the additional features they recite. Accordingly, Appellant believes that claims 3-5 and 10 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 3:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 15 under 35 U.S.C. § 103(a) as being obvious in view of the Cope et al. (U.S. Patent No. 4,160,926), Erdman et al. (IEEE Conference), and Andrus (U.S. Patent No. 2,573,126) references. However, claim 15 depends from independent claim 9. Consequently, dependent claim 15 is believed patentable not only for its dependency upon allowable base claim 9, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 15 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 4:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 16 and 20 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references. It is respectfully submitted that the Examiner has misapplied long-standing and binding legal precedents in rejecting the claims under 35 U.S.C. § 103(a). Accordingly, Appellant believes claims 16 and 20 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

In rejecting claims 16 and 20, the Examiner stated:

Erdman teaches a motor with a stator and rotor. The stator core and windings are covered with a varnish and then and [sic] covered with a paint (inherently bonded to the stator). Erdman does not teach the conductive paint covered with an insulative layer. Andrus teaches the stator covered with an insulative layer 8 (plastic) to seal the stator against moisture and allow the motor to operate in oil or water. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the motor of Erdman with an inner insulative layer, as in Andrus to seal the stator against moisture and allow the motor to operate in oil or water.

Independent claim 16 recites an “insulative layer disposed over said electrostatic shield between said conductive windings of said stator and said rotor.” This insulative layer of claim 16 is similar to, and serves the same purpose as, the “insulating, protective top coat” of

independent claims 1 and 9. Appellant respectfully submits that independent claim 16 is patentable over the references taken alone or in combination, for at least the same reasons provided above with respect to independent claims 1 and 9. Moreover, dependent claim 20 is also believed patentable for its dependency upon allowable independent claim 16 as well as by virtue of the additional features they recite. Reconsideration and a favorable review by the Board are respectfully requested.

**Issue No. 5:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claims 17, 18, and 22 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Cope et al. reference (U.S. Patent No. 4,160,926). However, claims 17, 18, and 22 depend from independent claim 16. Consequently, dependent claims 17, 18, and 22 are believed patentable not only for their dependencies upon allowable base claims 16, but also by virtue of the additional features they recite. Accordingly, Appellant believes that claims 17, 18, and 22 are currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**Issue No. 6:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 19 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference), Andrus (U.S. Patent No. 2,573,126), and Cope et al. (U.S. Patent No. 4,160,926) references. However, claim 19 depends from independent claim 16. Consequently, dependent claim 19 is believed patentable not only for its dependency upon allowable base claim 16, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 19 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.



**Issue No. 7:**

In the Final Official Action mailed February 13, 2003, the Examiner improperly rejected claim 21 under 35 U.S.C. § 103(a) as being obvious in view of the Erdman et al. (IEEE Conference) and Andrus (U.S. Patent No. 2,573,126) references, in further view of the Erdman et al. reference (U.S. Patent No. 5,661,353)(‘353). However, claim 21 depends from independent claim 16. Consequently, dependent claim 21 is believed patentable not only for its dependency upon allowable base claim 16, but also by virtue of the additional features it recites. Accordingly, Appellant believes that claim 21 is currently in condition for allowance, and respectfully requests favorable consideration by the Board.

**CONCLUSION**

The Commissioner is authorized to charge the requisite fee of \$320.00, and any additional fees which may be required, to Account No. 01-0857, Order No. 98RE017-A/YOD (REEL:0038--1). A duplicate copy of this sheet is enclosed.

**General Authorization for Extensions of Time**

In accordance with 37 C.F.R. § 1.136, Appellant hereby provides a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Appellant authorizes the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 01-0857, Order No. 98RE017-A/YOD (REEL:0038--1).

Respectfully submitted,

Date: 8/20/2003

1295  
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9. **APPENDIX OF CLAIMS ON APPEAL**

1. An electromechanical machine comprising:

a fixed stator having conductive windings located in a plurality of parallel, axially-extending winding slots defined about an inner surface of a magnetically permeable core, said stator further comprising first and second coilheads located at opposite axial ends of said magnetically permeable core;

each of said winding slots including an insulative top liner located radially inward of said conductive windings located therein;

a movable rotor located radially inward of said stator;

an electrostatic shield arrangement being formed by an insulative layer of resin material covered by a conductive layer located radially inward thereof;

said insulative layer and said conductive layer being conformally applied to said stator so as to be located in said winding slots radially inward of said respective top liner and an inside surface of said first and second coilheads to interpose said conductive windings and said rotor; and

an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.

2. An electromechanical machine as set forth in claim 1, wherein said conductive layer of said shield arrangement comprises a nonmagnetic conductive material located radially inward of said insulative layer.

3. An electromechanical machine as set forth in claim 2, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

4. An electromechanical machine as set forth in claim 3, wherein said conductive layer of said shield arrangement comprises a metallic paint applied to a surface of said insulative layer.

5. An electromechanical machine as set forth in claim 4, wherein said metallic paint comprises a copper paint.

7. An electromechanical machine as set forth in claim 1, wherein said insulative layer of said shield arrangement comprises a glass-filled thermoset resin applied to said conductive windings to a predetermined thickness.

8. An electromechanical machine as set forth in claim 7, wherein said thermoset resin substantially entirely impregnates said conductive windings of said stator.

9. An electromechanical machine comprising:  
a fixed stator having conductive windings located in a plurality of parallel, axially extending winding slots defined in a magnetically permeable core;  
a movable rotor operative to have a magnetic flux induced therein by excitation of said conductive windings of said stator;  
an insulative layer having a conformal structure characteristic of a resin that had been applied to said stator in an uncured state after said conductive windings were placed in said winding slots and subsequently cured to yield a predetermined layer thickness between said conductive windings and said rotor; and  
a conductive layer of metallic paint bonded to said insulative layer and thereby separated from said conductive windings, said insulative layer and said conductive layer thereby forming an electrostatic shield arrangement interposing said conductive windings and said rotor; and  
an insulating, protective top coat applied over said conductive layer on an inner surface of said stator.

10. An electromechanical machine as set forth in claim 9, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

11. An electromechanical machine as set forth in claim 9, wherein said metallic paint comprises a copper paint.

13. An electromechanical machine as set forth in claim 9, wherein said cured resin substantially entirely impregnates said conductive windings of said stator.

14. An electromechanical machine as set forth in claim 9, wherein said cured resin is a glass- filled thermoset resin.

15. An electromechanical machine as set forth in claim 14, wherein said predetermined thickness of said insulative layer is at least approximately 0.012 inches.

16. An electromechanical machine comprising:  
a stator having conductive windings located in a plurality of parallel, axially extending winding slots defined in a magnetically permeable core;  
a rotor disposed axially within said stator;  
an electrostatic shield comprising a conductive layer disposed on an inner surface of said stator at least opposite said rotor and electrically insulated from said conductive windings of the stator; and  
an insulative layer disposed over said electrostatic shield between said conductive windings of said stator and said rotor.

17. An electromechanical machine as set forth in claim 16, further comprising an insulative layer having a conformal structure characteristic of a resin that had been applied to said stator in an uncured state after said conductive windings were placed in said winding slots and subsequently cured to yield a predetermined layer thickness between said conductive windings and said rotor.

18. An electromechanical machine as set forth in claim 17, wherein said cured resin is a glass-filled thermoset resin.

19. An electromechanical machine as set forth in claim 17, wherein said predetermined thickness of said insulative layer is at least approximately 0.012 inches.

20. An electromechanical machine as set forth in claim 16, wherein said conductive layer comprises a conductive paint bonded to said stator.

21. An electromechanical machine as set forth in claim 16, wherein said conductive layer is in electrical communication with said magnetically permeable core and is grounded thereby.

22. An electromechanical machine as set forth in claim 16, wherein said cured resin substantially entirely impregnates said conductive windings of said stator.